Bone Graft Harvesting in the Upper Extremity: A Comparison of Two Techniques

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Objectives

- Harvesting autogenous bone graft from either the distal radius or olecranon process poses several advantages in upper extremity surgery, including proximity to the surgical site, relative ease of access, limited anesthetic requirements, and minimal postoperative morbidity.
- However, there is reluctance by many surgeons to consider the olecranon process as graft source.
- Purpose: This study provides a direct comparison between distal radius and olecranon bone graft harvesting using standardized outcome measures.

Methods

- 40 patients who underwent bone graft harvesting from the distal radius (DR, 15 patients) or olecranon process (OP, 25 patients) between 2004 and 2012 were evaluated retrospectively.
- Only patients whose donor site was positioned at least one bone or joint away from the operative site were included.
- The average follow-up interval was 6 months (range, 3 - 51 months).
- Outcome assessment included a Visual Analog Scale (VAS) questionnaire, physical examination, and radiographs of the bone graft harvest and recipient sites.
- Joint motion and grip strength measurements were compared between the operative and nonoperative extremities in each patient using paired t-tests.

Results

Outcome Assessment	Result
Patient Satisfaction	Greater than 90% of patients expressed very high satisfaction with either grafting procedure and responded that the grafting procedure did not interfere with their work activities or personal hygiene.
Pain in Operative Extremity	Residual pain at rest was reported in 20% of patients in both groups (3 DR, 5 OP).
Wrist Motion in Distal Radius Group	Wrist motion measurements were not significantly different between the operative and nonoperative limbs in the DR group.
Wrist Motion in Olecranon Group	Elbow motion measurements were not significantly different between the operative and nonoperative limbs in the OP group ($p > 0.05$).
Grip Strength	Grip strength measurements were significantly greater in the nonoperative extremity in the OP patients (mean 74 $\pm$ 27 pounds vs. 61 $\pm$ 24 pounds, $p < 0.01$).
Radiographic Bone Healing of Graft Site	Radiographic bone healing was observed in 88% of cases in which DR bone graft was utilized and in 78% of the cases where OP bone graft was used ($p > 0.05$).
Palpable Defect at Graft Site	A palpable defect at the donor site was detected in 76% of the OP cases and 13% of the DR cases, and a radiographic defect was discerned in 71% of all cases.
Complication Rate	Complications including incisional drainage, wound dehiscence, cellulitis, scar tenderness, and peri-incisional sensory disturbance occurred in 25% of DR cases and 20% of OP cases but no patients required additional surgery.

Conclusion

Autogenous bone grafting from either the distal radius or olecranon process will lead to comparable outcomes. Complications may occur with either technique but will likely not require additional surgery.

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